E19

Migration to CICS TS for VSE/ESA, Is it time to do it?

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Migration to CICS TS for VSE/ESA

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Topics

- History
- Planning
- Implementation
- Resource Definition
- Security
- Application Program Considerations

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Topics…

- Customization
- Statistics and Monitoring
- Problem Determination
- Additional information
- Summary

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History

- CICS/VSE Version 2
  - Announced 9/05/1990
  - Last release CICS/VSE 2.3
    - Announced in 1994
    - Last release to support older CICS functions
    - Still provided with z/VSE 4.1
- CICS TS for VSE/ESA Version 1
  - Announced 9/29/1998
  - Major new CICS product for VSE

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Planning

- Not your typical CICS migration
- Major differences
  - Re-architected CICS
  - Discontinued functions
    - PCT, PPT and RDO-eligible TCT macro definitions
    - Support for macro level programs
    - Support for RPG programs
    - Direct access to CICS control blocks
    - Internal security
    - BTAM

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Planning…

- CICS TS for VSE/ESA 1.1
  - Based on CICS for MVS/ESA 4.1 + function from CICS TS for OS/390
  - Report Controller integrated into product
  - Pre-installed in PRD1.BASE
    - Generation Feature into PRD2.GEN1 (Optional)
  - Works with
    - Basic Security Manager or External Security Manager
    - VSE/ESA Interactive Interface
    - VSE/ICCF

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Planning…

- Optional Products
  - BTAM no longer orderable, must be copied from current system, not support by CICS TS
  - DL/I VSE 1.11 supports CICS TS only
  - DL/I DOS/VS 1.10 supports CICS/VSE 2.3 only
  - DB2 Server for VSE and VM 6.1 or higher required for CICS TS

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Planning…

- Optional Products
  - COBOL for VSE/ESA, PL/I for VSE/ESA, C for VSE/ESA
  - DOS/VS COBOL no longer available
    - Copy jobs in APARs PQ00970 and PQ00971
  - DFSORT/VSE or equivalent sort product with E15 and E35 exits
    - Required to process statistics with DFHSTUP

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Planning…

- Vendor Products
  - Review currently installed versions for CICS TS support
    - Vendor websites
    - Service and Support page on VSE/ESA website www-1.ibm.com/servers/eserver/zseries/os/vse/
  - May require release or maintenance upgrade
  - May require replacement if no CICS TS support

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Planning…

- Preparing to migrate
  - Read the CICS TS Migration Guide and Redbook
  - Read them again!!
- Develop a migration plan
  - Install, test
  - Migrate discontinued functions on current CICS/VSE system
  - Gain familiarity with new parameters and tuning options

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Implementation

- CICS TS Partitions
  - 50MB F2 for CICS TS with ICCF
  - Additional CICS TS partitions
    - Static or dynamic partition
    - Recommended minimum 50MB allocation
    - Virtual storage requirements larger the CICS/VSE
  - Cannot run CICS TS with subsystem storage protection in F4
  - FB (default) for VSE BSM Security Server

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Implementation…

- Virtual storage requirements are larger
  - CICS TS 31-bit partition GETVIS
    - Must be at least 12.5MB plus storage for VSAM buffers
  - More data space usage
    - Basic Security Manager
    - CICS Data Management Facility (DMF)
    - CICS Shared Data Tables
    - Environment B SYSDEF DSIZE=20MB
  - May require more real memory

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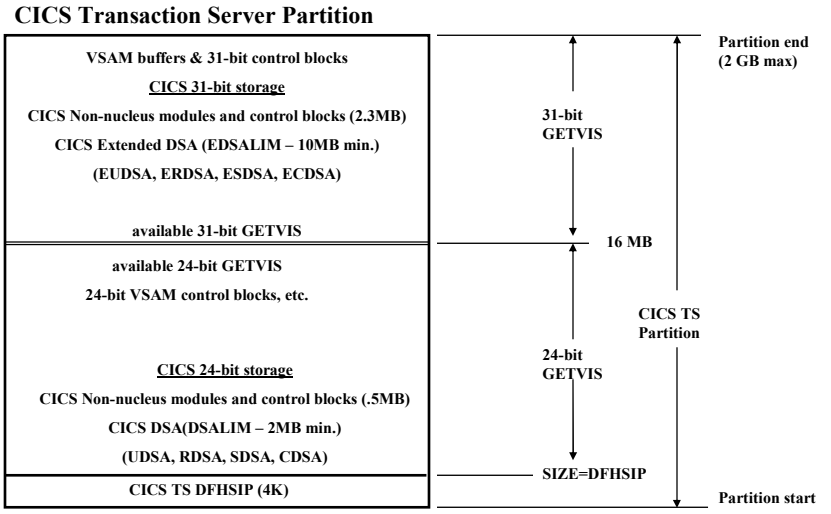
Implementation…



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Implementation…

- Virtual Storage Considerations
  - 24-bit and 31-bit dynamic storage areas required
    - EDSALIM - limits 31-bit DSAs
      - Recommend supplied value of 25MB or greater
    - DSALIM - limits 24-bit DSAs
      - Use value based on CICS/VSE 2.3 startup message: "SUBPOOL SIZE BEFORE LOADING RESIDENT PROGRAMS"
    - Other SIT parameters allocate individual DSAs
      - Recommend default 0 to let CICS do dynamic allocations

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Implementation…

- Virtual Storage Considerations
  - Task storage allocated based on MXT value
    - Limits total number of user tasks
    - Storage pre-allocated in DSAs for MXT and 10 system tasks
    - MXT=999 is not good (uses 3.6MB)
    - Specify MXT value based on CICS/VSE 2.3 shutdown statistics:

      "Peak number of tasks reached"

      "Number of times at max task"

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Implementation…

- CICS system datasets
  - CSD file is required!!!
    - Definition moved from FCT to SIT
  - Restart dataset (DFHRSD)
    - For emergency restart only
    - Other information moved to new VSAM KSDS catalog datasets
  - DFHSTM and DFHSTN obsolete

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Implementation…

- CICS system datasets… (new)
  - Global catalog (DFHGCD)
    - Journal status and restart control records
    - Installed RDO resources
    - Restart control record
  - Local catalog (DFHLCD)
    - CICS TS domain status information
    - Formatted with DFHCCUTL utility

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Implementation…

- CICS system datasets… (new)
  - Data Management Facility (DMF) datasets
    - Statistics and monitoring data collection
    - DFHDMFA, DFHDMFB
  - Journal Archive Control Dataset (DFHJACD)
    - Required for automatic journal archiving
    - Not created during installation

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Implementation…

- CICS System Datasets…
  - Defined for CICS/ICCF partition during install
    - VSAMDEFS.Z and VSAMINIT.Z
  - Definitions for second CICS partition
    - Use skeleton jobstream in ICCF library 59
    - SKPREPC2

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Implementation…

- Startup jobstream changes
  - CICS/VSE 2.3

    EXEC DFHSIP,**SIZE=nnnnK**,PARM='xxx',DSPACE=2M
  - CICS TS

    // ID USER=DBDCCICS
    - CICS region userid for security

    // EXEC DFHSIP statement

    SIZE=DFHSIP,PARM='xxx',DSPACE=2M,**OS390**
    - Program area only used for DFHSIP
    - CICS TS functions use OS/390 emulation mode
    - SKCICS and SKCICS2 skeletons in ICCF library 59

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Implementation…

- Migrate macro tables to CSD and RDO
  - PCT, PPT, RDO-eligible TCT entries
  - FCT (optional)
- Update SIT parameters
  - Many new/changed/obsolete entries
- Review other tables for new/changed parameters

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Implementation…

- CICS system initialization parameter changes
  - 96 new parameters
  - 28 changed
  - 30 removed
  - Some defined in startup job only
  - Use skeletons in ICCF library 59
    - DFHSITSP for CICSICCF
    - DFHSITC2 for additional CICS TS partitions

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Resource Definition

- CICS system definition file (CSD) is mandatory
  - *Required* for transactions, VTAM terminals, MRO/ISC connections and sessions, VSE console terminals
  - *Required* for programs and mapsets
    - Or use new Program Autoinstall

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Resource Definition…

- New support for defining
  - VSAM files
  - LSRPOOLs
  - TRANCLASSes
  - VSE console terminals
  - Can still use FCT macro table for VSAM files and LSRPOOLs
    - *Must* use macro table for DA files

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Resource Definition…

- Use IBM supplied definitions for new entries and new/changed parameters
- Transactions, programs, mapsets, VTAM and VSE console terminals
  - RDO entries in supplied CSD file
  - DFHxxxxx and VSExxxxx groups
  - CEE group (LE/VSE), TCPIP group (TCPIP for VSE/ESA)

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Resource Definition…

- Other resources still defined using tables
  - TCT for SAM terminals, remote terminals for transaction routing, logical device codes
  - Journals (JCT), Transient Data Queues (DCT), Program Lists for startup and shutdown (PLTPI and PLTSD), MCT, SRT, TLT, TST, XLT, etc.
  - ALT, NLT and SNT are no longer supported

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Resource Definition…

- Macro tables
  - DCT, FCT, JCT, PLT, SIT, TST, XLT
  - Supplied skeletons in ICCF library 59 (DFHxxxxx)
    - Suffix SP for primary CICS TS partition
      - Startup PLT – PI, shutdown PLT - SD
    - Suffix C2 for second CICS TS partition
      - Startup PLT – P2, shutdown PLT – S2

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Resource Definition…

- Migrate discontinued macro tables
  - Remove IBM supplied entries
  - Optionally add DFHxxx TYPE=GROUP to define RDO groups
  - Assembly with CICS TS supplied macros
  - Migrate to CSD with DFHCSDUP batch utility
- Migrate supported macro tables
  - Update with new/changed parameters and entries
  - Reassemble with CICS TS

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Resource Definition…

- Migrate CSD definitions
  - Restore CICS/VSE CSD
  - Method 1: Upgrade CICS/VSE CSD with DFHCSDUP utility
    - CICS and VSE supplied entries
  - Method 2: Copy application groups from CICS/VSE CSD to CICS TS CSD (recommended)

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Security

- Internal security withdrawn
  - No SNT
  - CICS sign-on changed
  - Several parameters obsolete
- External Security Manager (ESM) used for all security checking
- All security based on 8 character userid
- Utilities to convert DFHSNT and PCT definitions

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Security...

- Obsolete parameters
  - TRANSEC on transaction definitions
  - RSL on resource definitions
  - OPERID, OPERPRTY, OPERRSL, OPERSEC in terminal and session definitions
  - XSNAME (SECURITYNAME) in MRO/ISC definitions
  - EXTSEC in SIT

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CICS TS Security Choices

- No security
  - Built into application or not required
  - SIT SEC=NO
- Basic Security Manager (BSM)
  - User sign-on and transaction security
  - Enhanced in z/VSE 3.1.1 and later to support resource security
- External Security Manager
  - Vendor product or write your own
  - "Full function" depending on product

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Basic Security Manager

- Basic ESM part of VSE/ESA 2.4 and later
- Basic security support for CICS TS
  - Sign-on security
  - Transaction-attach security
  - Operates independent of IPL SYS SEC setting
  - Requires SIT SEC=YES, XTRAN=YES
- Support for DTSECTAB system security
  - IPL SYS SEC=YES

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Basic Security Manager...

- BSM prior to z/VSE 3.1.1 does not support
  - Resource security checking
  - Report Controller security
  - Command security
  - Surrogate user checking
  - MRO/ISC security

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Basic Security Manager...

- Enhanced in z/VSE 3.1.1 and later
  - Support for CICS resource access security
    - Programs, files, journals
    - Started transactions
    - Temporary storage and transient data
    - Report Controller spool and printer access
  - Support for application (APPL) and facility resource classes
  - New BSM security dialogs, BSTADMIN utility and security repository VSAM file BSTCNTL

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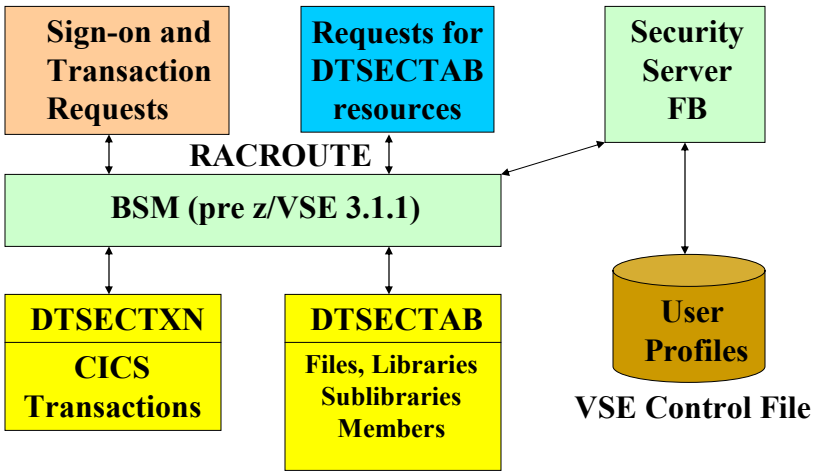
Basic Security Manager…



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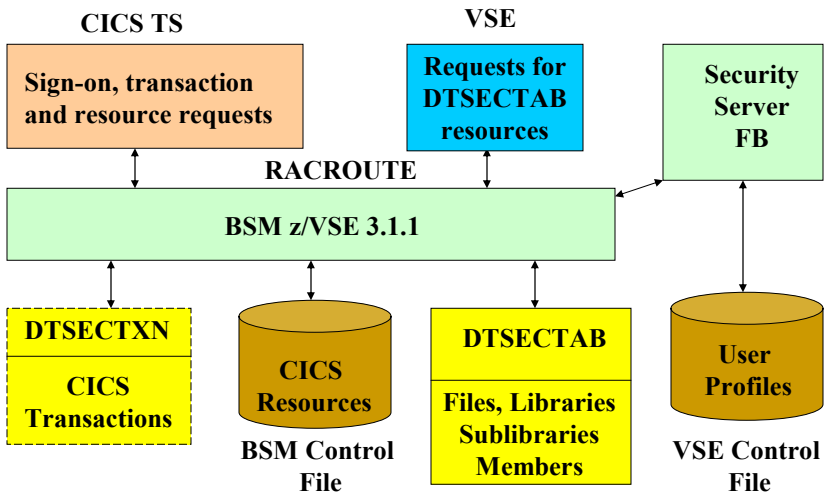
Basic Security Manager …



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Basic Security Manager…

- CICS TS signon options
  - VSE/ESA signon panel (IEGM)
  - CICS TS CESN transaction
  - User written sign-on program
    - EXEC CICS SIGNON

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Basic Security Manager…

- Review and update BSM security definitions
  - Transaction security definitions
    - Security class 1 defined for all CICS transactions (CEMT, CEDA, CECI, etc.)
    - DITT(O) transaction defined with security class 61
  - Default security
    - Security profile required for CICS default user
      - SIT DFLTUSER=CICSUSER
      - CICSUSER profile defined with security classes 1, 60-64
    - Default user should have minimum level security
      - Security classes 1 and 61

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Security Migration

- Utilities to convert transaction security
  - REXX procedures in ICCF library 59
  - Creates definitions for old or new security method
  - DTSECTXS.PROC
    - Converts PCT source to BSM transaction security definitions
  - DTSECTX2.PROC
    - Converts Security Migration Aid (SMA) file entries to BSM transaction security definitions
  - DTSECTX3.PROC
    - Converts DEFINE TRANSACTION definitions from DFHCSDUP EXTRACT function to BSM transaction security definitions

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Security Migration...

- Security Migration Aid (SMA)
  - Stage one of two stage security migration
  - Menu driven online program
  - Extracts security information from a running CICS/VSE system and the VSE IUI control file
  - Creates VSAM KSDS file DFHXSMA
    - Records containing VTAM APPLID, resource type, resource name, RSL and TRANSEC values
    - Used as input to ESM supplied stage two utilities

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External Security Manager

- Vendor supplied products
  - Level of security support may vary
  - Check vendor documentation for details
- Computer Associates Top Secret
- B.I. Moyle BIM-Alert/CICS
- MacKinney Systems CICS/Signon
- Others???

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Application Program Considerations

- Command level only
  - DOS/VS COBOL programs compiled with CBL STATE and FLOW will abend CICS TS
- Macro level programs are not supported
  - Identify with DFHMSCAN utility
  - Convert to Command Level using the CICS Application Migration Aid (AMA)
- New translator option SPI to use System Programming Interface EXEC Commands

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Application Program Considerations…

Supported: Programs Compiled By

Compiler	Run-Time Library
COBOL for VSE/ESA	LE/VSE
High Level Assembler/Assembler	None or LE/VSE
PL/I for VSE/ESA	LE/VSE
C for VSE/ESA	LE/VSE
DOS/VS COBOL	LE/VSE[1]
VS COBOL II	LE/VSE[2]

[1] Will probably run if link-edited with DOS/VSE COBOL or COBOL II run-time library, but not supported if it fails. Support for compiler ended 12/1999.

[2] Will probably run if link-edited with COBOL II run-time library, but not supported if it fails. Support for compiler ended 4/1998.

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Application Program Considerations...

Not Supported: Programs Compiled By

Compiler	Run-Time Library
DOS PL/I	Any
C/370	Any
RPG II	Any

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Application Program Considerations…

- EXEC CICS API commands
  - Security related parameters
    - ASSIGN OPERKEYS or OPSECURITY
      - Not supported
    - ASSIGN USERNAME
      - Returns blanks using BSM
      - Depends on ESM
    - Can use ASSIGN USERID and ASSIGN OPID
  - ADDRESS CSA not supported

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Customization

- Review all customization interfaces
- No sysgen or SIT overlays
- PLTPI separated into three stages
- Define PLT programs with EXECKEY(CICS)
- Rework Global User Exits (GLUEs)
- Review User Replaceable Modules (URMs)

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Customization…

- Global User Exits
  - 35 New and 8 removed exit points
  - Standardized linkage conventions for all exits
  - New Exit Programming Interface (XPI)
    - Access to CICS services
  - Must be 31-Bit capable
  - Existing programs *must* be changed

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Customization...

- User Replaceable Modules (URMs)
  - Must be command level
  - Must be AMODE(31)
  - Use COMMAREA instead of internal control blocks
  - VSE supplied URMs in ICCF lib 59 have been updated
    - DFHPEP, IESZNEP (NEP)
    - IESZATDX (autoinstall)

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Statistics and Monitoring

- New Data Management Facility (DMF) used for collecting statistics and monitoring data
  - Used for BSM security logging in z/VSE 4.1
- Obsolete statistics/monitoring definitions
  - CSSM and CSSN transient data queues
  - CSTT statistics transaction
  - DFHSTM and DFHSTN statistic datasets
  - Journals for monitoring data

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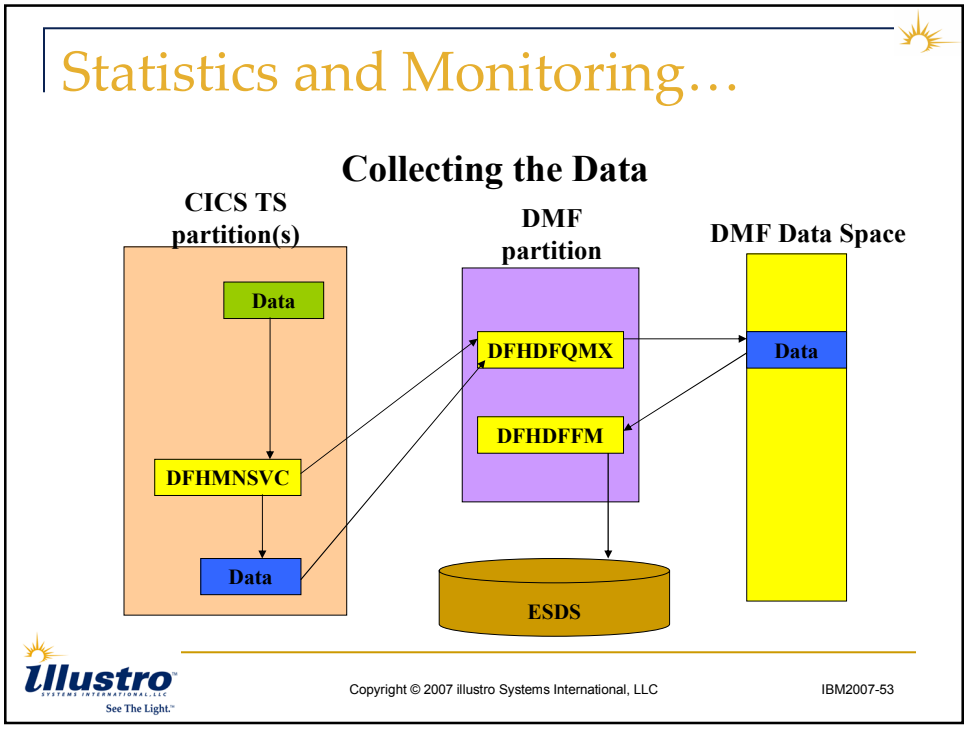

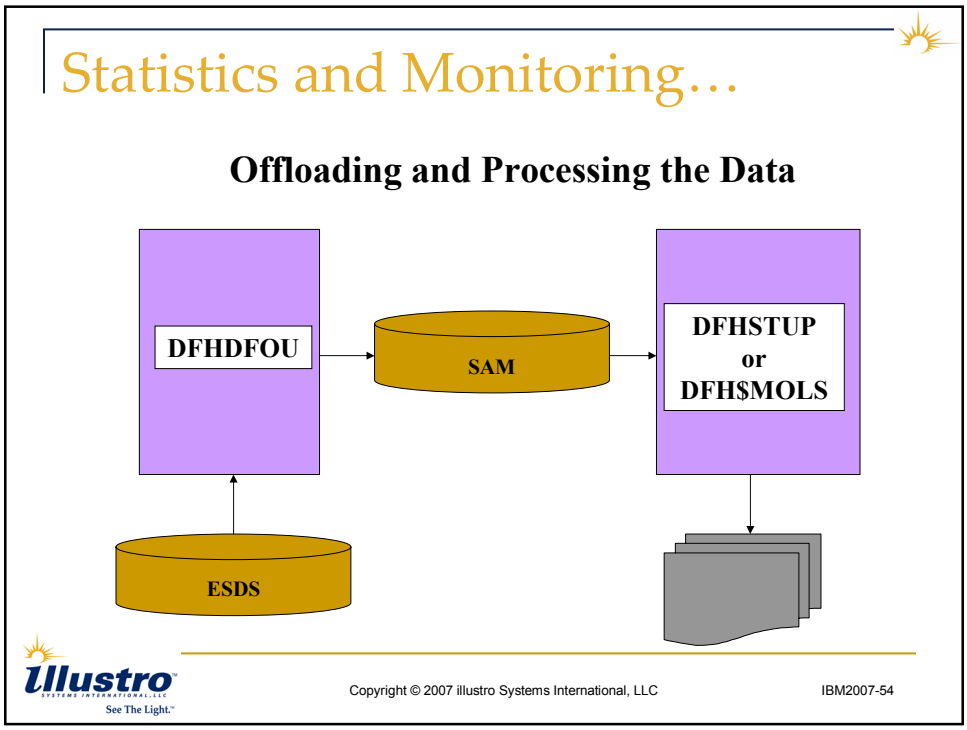

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Statistics - DFH0STAT

- Sample program DFH0STAT.C
  - COBOL for VSE/ESA source in PRD1.BASE
  - Uses EXEC CICS statistics commands (SPI)
  - Output to
    - VSE/POWER LST queue using Report Controller
    - CICS Temporary Storage queue
  - Can be invoked from
    - Terminal
    - VSE console
    - PLTSD
    - As a STARTed transaction

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Problem Determination

- More trace and dump granularity
  - Dump Tables
    - Transaction
      - By transaction abend code
    - System
      - By system dump code
    - Created by
      - CEMT SET
      - EXEC CICS SET
  - New trace entries and trace levels

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Problem Determination…

- New trace and dump utility programs
  - DFHTU410 formats auxiliary trace
  - DFHDU410 formats transaction dumps
  - DFHPD410 formats system dumps
- Several options to control dump and trace
  - New SIT parameters
  - New CEMT options
  - New CETR transaction

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Problem Determination…

- Review SIT options affecting dump and trace
  - DUMP=YES|NO
    - Controls taking of system dumps
  - SYDUMAX=999,TRDUMAX=999
    - Maximum number of system and transaction dumps per dump code
  - TRTRANSZ=512
    - Size of transaction trace table in KB
  - TRTABSZ=256
    - Size of system trace table in KB

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Problem Determination…

- Suppress system dumps for ASRA and ASRB abend
  - SIT ABDUMP and PCDUMP options obsolete
  - Specify in system dump table

```
CEMT SET SYDUMPCODE(AP0001)  ADD  NOSYSDUMP
CEMT SET SYDUMPCODE(SR0001)  ADD  NOSYSDUMP
                or from a PLT initialization program
EXEC CICS SET SYDUMPCODE(AP0001)  ADD  NOSYSDUMP
EXEC CICS SET SYDUMPCODE(SR0001)  ADD  NOSYSDUMP
```

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Summary

- Migration to CICS TS takes more planning
- Some steps can be done on current CICS/VSE partition
  - Implement RDO
  - Install a security manager
  - Migrate discontinued functions
- Good planning and education will lead to a successful migration

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Additional Information

- CICS TS books
  - Release Guide (GC33-1646)
  - Migration Guide (GC33-1645)
  - http://www.software.ibm.com/ts/cics
- Redbooks
  - Migration to VSE/ESA 2.4 and CICS Transaction Server for VSE/ESA 1.1 (SG24-5595)
  - Implementation of VSE/ESA 2.4 and CICS Transaction Server for VSE/ESA 1.1 (SG24-5624)
  - http://www.redbooks.ibm.com

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Additional Information…

- illustro Education Courses
  - CICS Transaction Server for VSE/ESA Migration (A3731)
  - CICS Transaction Server for VSE/ESA Tuning and Problem Determination (A3732)
  - CICS Transaction Server for VSE/ESA Under the Covers (A3733)

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